## IN THE CLAIMS

1. (Currently Amended) A method for communicating between at least a first wireless central station and a plurality of wireless remote stations in a wireless instrumentation system comprising the steps of:

transmitting information from said central station to said remote stations through a plurality of wireless links;

determining whether one or more of said remote stations has become a lost station due to a communication failure between said central station and said lost station;

identifying from said central station at least one of said remote stations that can act as a relay station that can relay information from said central station to said lost station or to another of said remote stations that can also act as a relay station; and

transmitting information between said central station and said lost station via said one or more relay stations.

2. (Original) The method of claim 1, wherein said step of determining whether one or more of said remote stations has become a lost station comprises:

transmitting one or more polling signals from said central station to said remote stations; and

identifying one or more of said remote stations from which a reply to said polling signal has not been received by said central station as a lost station.

3. (Original) The method of claim 2, wherein the step of identifying at least one of said remote stations that can act as a relay station comprises:

1) transmitting from said central station to a first one of said remote stations from which a reply to said one or more polling signals was received, information for said lost station;

2) if a reply is received by from said first one of said remote stations by said central station confirming that said information was successfully relayed to said lost station, then sending future information for said lost station to said first one of said remote stations as a relay station for said lost station; and

3) if a reply is not received by from said first one of said remote stations by said central station confirming that said information was successfully relayed to said lost station, then repeating steps 1 and 2 for additional ones of said remote stations from which a reply to said one or more polling signals was received by said central station.

4. (Original) The method of claim 3, wherein said central station communicates with said remote stations using a first communication transmit/receive frequency pair and said relay station communicates with said lost station or another one of said remote stations using a second transmit/receive communication frequency pair.

5. (Original) The method of claim 4, wherein if any of said remote stations does not receive a polling signal from said central station within a predetermined period of time and is thus determined to be a lost station, said lost station will switch its transceiver to communicate information using said second transmit/receive communication frequency pair so that said lost station can communicate using said second transmit/receive communication frequency pair with one of said remote stations that is attempting to act as a relay station for said lost station.

6. (Original) The method of claim 5, wherein If said lost station does not receive a polling signal from said central station within a predetermined period of time using the second transmit/receive communication frequency pair, said lost station will switch its transceiver to a third transmit/receive communication frequency pair so that said lost station can receive information sent using said third transmit/receive communication frequency pair from one of said remote stations that is attempting to act as a relay station for said lost station.

7. (Original) The method of claim 1, wherein if at least two of said remote stations are identified as lost stations, then said steps of identifying and transmitting comprise:

identifying at least one of said remote stations that can act as a first relay station and communicate both with said central station and a first of said lost stations, said first lost station being selected as one that can act as a second relay station that can communicate both with a second of said lost stations and said first relay station; and

transmitting information between said central station and said second lost station using said first and second relay stations.

8. (Original) The method of claim 7, wherein the step of transmitting employs a first transmit/receive communication frequency pair between said central station and said first relay station, a second transmit/receive communication frequency pair between said first relay station and said first lost station, and a third transmit/receive communication frequency pair between said first lost station and said second lost station.

9. (Original) The method of claim 1, wherein each of said remote stations is associated with a measurement sensor and can send sensor measurement data back to said central station.

10. (Original) The method of claim 9, wherein said remote stations each include a processor for analyzing measurement data generated by said sensor.

11. (Original) The method of claim 9, wherein each of said remote stations is modular in construction and includes a power module, a transceiver module and a custom module, said custom module being selected in accordance with a particular sensor associated with the remote station.

12. (Original) The method of claim 1, wherein one or more of said remote stations includes a controller that operates said remote station in first and second alternating power modes, said modes including a low power mode during which said remote station transceiver is not operating and a power up mode during which said transceiver is operating, said controller being programmed to control said power modes such that said remote station is operated in a repeating cycle of said low power mode for a first selected period of time followed by said power up mode for a second selected period of time as long as no information is being received from said central station, but if during said power up mode, said controller detects that information is being received form said central station, said controller maintains said remote station in said power up mode until said remote station transceiver has received said information, said controller has processed said information and said transceiver has sent a reply back to said central station, after which said controller switches said remote station back to said low power mode for said first selected period of time.

13. (Original) The method of claim 12, wherein said first and second selected time periods are adjustable either by said controller in said remote station or by a controller in said central station.

14. (Original) The method of claim 12, wherein at least one of said remote stations includes modules that can be selectively operated by said controller during said low power mode and said power up mode.

15. (Original) The method of claim 12, wherein said central station is programmed to send information to each of said remote stations repeatedly until said remote stations acknowledge receipt of said information.

16. (Original) A method for communicating between one or more wireless central stations and a plurality of wireless remote stations comprising the steps of:

periodically transmitting information from said central station to said remote stations;

operating one or more of said remote stations in first and second alternating power modes, said modes including a low power mode during which said remote station transceiver is not operating and a power up mode during which said transceiver is operating, said controller being programmed to control said power modes such that said remote station is operated in a repeating cycle of said low power mode for a first selected period of time followed by said power up mode for a second selected period of time as long as no information is being received from said central station, but if during said power up mode, said controller detects that information is being received form said central station, said controller maintains said remote station in said power up mode until said remote station transceiver has received said information, said controller has processed said information and said transceiver has sent a reply back to said central station, after which said controller switches said remote station back to said low power mode for said first selected period of time.

17. (Original) The method of claim 16, wherein said first and second selected time periods are adjustable either by said controller in said remote station or by a controller in said central station.

18. (Original) The method of claim 16, wherein at least one of said remote stations includes modules that can be selectively operated by said controller during said low power mode and said power up mode.

19. (Original) The method of claim 16, wherein said central station is programmed to send information to each of said remote stations repeatedly until said remote stations acknowledge receipt of said information.

20. (Original) The method of claim 16, wherein each of said remote stations is associated with a measurement sensor and can send sensor measurement data back to said central station.

21. (Original) The method of claim 20, wherein at least one of said remote stations includes a processor for analyzing measurement data generated by said sensor.

22. (Original) The method of claim 16, wherein each of said remote stations is modular in construction and includes a power module, a transceiver module and a custom module, said custom module being selected in accordance with a particular sensor associated with the remote station.

23. (Original) The method of claim 22, wherein said controller is programmed to selectively power up any of said modules, depending upon information received from said central station.

24. (Original) A wireless instrumentation system comprising:

at least one central station including an RF transceiver and a controller; and

a plurality of remote stations for transmitting communications to and receiving communications from said central station, each said remote station including an RF transceiver and a controller;

wherein, said central station controller is programmed to:

determine whether any of said remote stations has become a lost station due to a communication failure between said central station and said lost station;

identify at least one of said remote stations that can act as a relay station that can relay information from said central station to said lost station or to another of said remote stations that can also act as a relay station; and

transmit information between said central station and said lost station via said one or more relay stations.

25. (Original) The system of claim 24, wherein said central station controller determines whether any of said remote stations has become a lost station by carrying out the steps of:

transmitting one or more polling signals from said central station to said remote stations; and

identifying one or more of said remote stations from which a reply to said polling signal has not been received by said central station as a lost station.

26. (Original) The system of claim 25, wherein said central station controller is programmed to identify at least one of said remote stations that can act as a relay station by carrying out the steps of:

1) transmitting from said central station to a first one of said remote stations from which a reply to said one or more polling signals was received, information for said lost station;

2) if a reply is received by from said first one of said remote stations by said central station confirming that said information was successfully relayed to said lost station, then sending future information for said lost station to said first one of said remote stations as a relay station for said lost station; and

3) if a reply is not received by from said first one of said remote stations by said central station confirming that said information was successfully relayed to said lost station, then repeating steps 1 and 2 for additional ones of said remote stations from which a reply to said one or more polling signals was received by said central station.

27. (Original) The system of claim 26, wherein said central station communicates with said remote stations using a first communication transmit/receive frequency pair and said relay station communicates with said lost station or another one of said remote stations using a second transmit/receive communication frequency pair.

28. (Original) The system of claim 26, wherein if any of said remote stations does not receive a polling signal from said central station within a predetermined period of time and is thus determined to be a lost station, said lost station will switch its transceiver to communicate information using said second transmit/receive communication frequency pair so that said lost station can communicate using said second transmit/receive communication frequency pair with one of said remote stations that is attempting to act as a relay station for said lost station.

29. (Original) The system of claim 28, wherein said lost station does not receive a polling signal from said central station within a predetermined period of time using the second transmit/receive communication frequency pair, said lost station will switch its transceiver to a third transmit/receive communication frequency pair so that said lost station can receive information sent using said third transmit/receive communication frequency pair from one of said remote stations that is attempting to act as a relay station for said lost station.

30. (Original) The system of claim 24, wherein if at least two of said remote stations are identified as lost stations, then said steps of identifying and transmitting comprise:

identifying at least one of said remote stations that can act as a first relay station and communicate both with said central station and a first of said lost stations, said first lost station being selected as one that can act as a second relay station that can communicate both with a second of said lost stations and said first relay station; and

transmitting information between said central station and said second lost station using said first and second relay stations.

31. (Original) The system of claim 30, wherein the step of transmitting employs a first transmit/receive communication frequency pair between said central station and said first relay station, a second transmit/receive communication frequency pair between said first relay station and said first lost station, and a third transmit/receive communication frequency pair between said first lost station and said second lost station.

32. (Original) The system of claim 24, wherein each of said remote stations is associated with a measurement sensor and can send sensor measurement data back to said central station.

33. (Original) The system of claim 32, wherein said remote stations include a processor for analyzing measurement data generated by said sensor.

34. (Original) The system of claim 32, wherein each of said remote stations is modular in construction and includes a power module, a transceiver module and a custom module, said custom module being selected in accordance with a particular sensor associated with the remote station.

35. (Original) The system of claim 24, wherein one or more of said remote station controllers operates said remote station in first and second alternating power modes, said modes including a low power mode during which said remote station transceiver is not operating and a power up mode during which said transceiver is operating, said controller being programmed to control said power modes such that said remote station is operated in a repeating cycle of said low power mode for a first selected period of time followed by said power up mode for a second selected period of time as long as no information is being received from said central station, but if during said power up mode, said controller detects that information is being received form said central station, said controller maintains said remote station in said power up mode until said remote station transceiver has received said information, said controller has processed said information and said transceiver has sent a reply back to said central station, after which said controller switches said remote station back to said low power mode for said first selected period of time.

36. (Original) The system of claim 35, wherein said first and second selected time periods are adjustable either by said controller in said remote station or by said controller in said central station.

37. (Original) The system of claim 35, wherein at least one of said remote stations includes modules that can be selectively operated by said controller during said low power mode and said power up mode.

38. (Original) The system of claim 35, wherein said central station controller is programmed to send information to each of said remote stations repeatedly until said remote stations acknowledge receipt of said information.

39. (Original) A wireless instrumentation system comprising:

at least one central station including an RF transceiver and a controller; and

a plurality of remote stations for transmitting communications to and receiving communications from said central station, each said remote station including an RF transceiver and a controller;

wherein, said central station controller is programmed to transmit information from said central station to said remote stations; and

each said remote station controller is programmed to operate said remote station in first and second alternating power modes, said modes including a low power mode during which said remote station transceiver is not operating and a power up mode during which said transceiver is operating, said controller being programmed to control said power modes such that said remote station is operated in a repeating cycle of said low power mode for a first selected period of time followed by said power up mode for a second selected period of time as long as no information is being received from said central station, but if during said power up mode, said controller detects that information is being received form said central station, said controller maintains said remote station in said power up mode until said remote station transceiver has received said information, said controller has processed said information and said transceiver has sent a reply back to said central station, after which said controller switches said remote station back to said low power mode for said first selected period of time.

40. (Original) The system of claim 39, wherein said first and second selected time periods are adjustable either by said controller in said remote station or by said controller in said central station.

41. (Original) The system of claim 39, wherein at least one of said remote stations includes modules that can be selectively operated by said controller during said low power mode and said power up mode.

42. (Original) The system of claim 39, wherein said central station controller is programmed to send information to each of said remote stations repeatedly until said remote stations acknowledge receipt of said information.

43. (Original) The system of claim 39, wherein each of said remote stations is associated with a measurement sensor and can send sensor measurement data back to said central station.

44. (Original) The system of claim 43, wherein at least one of said remote stations includes a processor for analyzing measurement data generated by said sensor.

45. (Original) The system of claim 39, wherein each of said remote stations is modular in construction and includes a power module, a transceiver module and a custom module, said custom module being selected in accordance with a particular sensor associated with the remote station.

46. (Original) The system of claim 45, wherein said controller is programmed to selectively power up any of said modules, depending upon information received from said central station.